

# Usability of Hydroxyurea for sickle cell disease patients in low-resource settings – retrospective cohort study in informal settlements of Nairobi, Kenya

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## Introduction

### Disease: sickle cell disease

- monogenic disorder
- rendering red blood cells dense, rigid, and sickling
- results in vaso-occlusion, impaired blood flow, and acute and chronic complications

### Treatment: hydroxyurea / hydroxycarbamide

- cytostatic drug
- can decrease frequency and severity of vaso-occlusive crises, transfusion rates, and increase life expectancy

### Setting: informal settlements

- comprehensive clinic
- Nairobi, Kenya

### Aim: describe hydroxyurea use and its associated outcomes in this special setting of informal settlements in Nairobi, Kenya

## Methods

### Data:

- retrospective data
- 2'206 clinical visits
- 328 sickle-cell patients
- March 1st 2019 – March 31st 2021

### Exposure:

- use of hydroxyurea
- dosage of hydroxyurea

### Outcomes:

- clinical outcomes
  - vaso-occlusive crisis
  - major complication (acute coronary syndrome, aplastic crisis, splenic sequestration, stroke, ulcer)
  - infection (urinary tract, pneumonia, osteomyelitis, malaria, etc.)
- laboratory measurements
  - haemoglobin (g/dl)
  - mean corpuscular volume (fl)

### Methods:

- mixed linear regression
- mixed competing-risk Cox regression
- adjustment for baseline laboratory measurements, event history, weight < 5<sup>th</sup> percentile, age at baseline, gender

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## Results

- incidence rate of vaso-occlusive crisis and infection was lower in users compared to non-users
- incidence of major complications was somewhat higher for users, but low in both groups

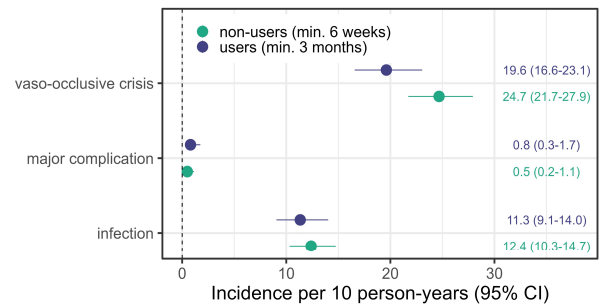


Figure 1: incidence rates of clinical outcomes per 10 person-years for hydroxyurea users vs. non-users, along with 95% confidence intervals

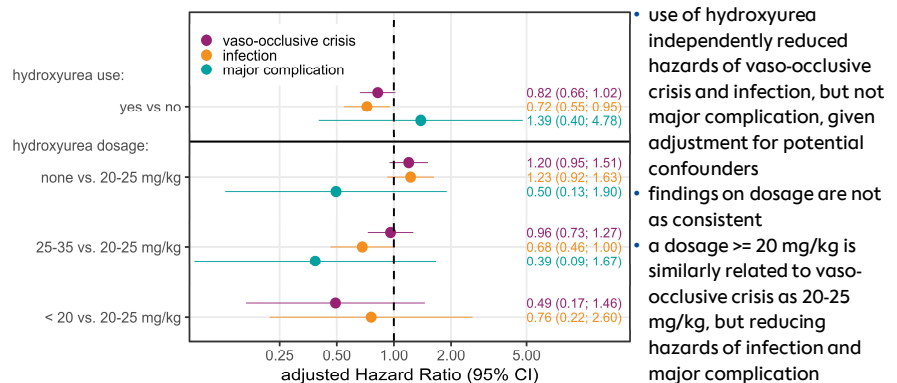


Figure 2: hazard ratios of clinical outcomes for hydroxyurea use and dosage, with 95% confidence intervals

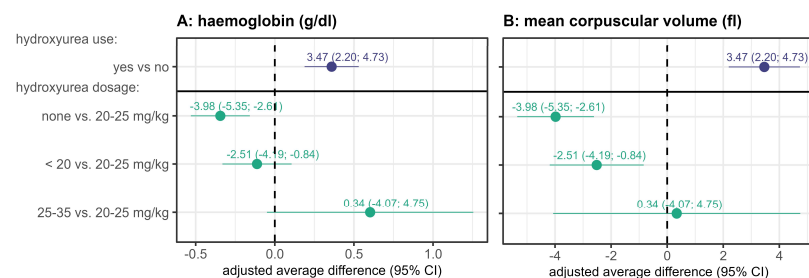


Figure 3: regression coefficients for hydroxyurea use and dosage, with 95% confidence intervals

- Hydroxyurea use independently increased both hemoglobin and mean corpuscular volume, given adjustment for potential confounders

## Conclusion

- given close patient monitoring, hydroxyurea use in this setup of informal settlements may be associated with a decreased hospitalization rate and less frequent vaso-occlusive episodes
- hydroxyurea might not be beneficial in averting subsequent complications
- further investigations needed to learn more about hydroxyurea's effectiveness, advantages and disadvantages in this specific pediatric population